BEST AVAILABLE COPY

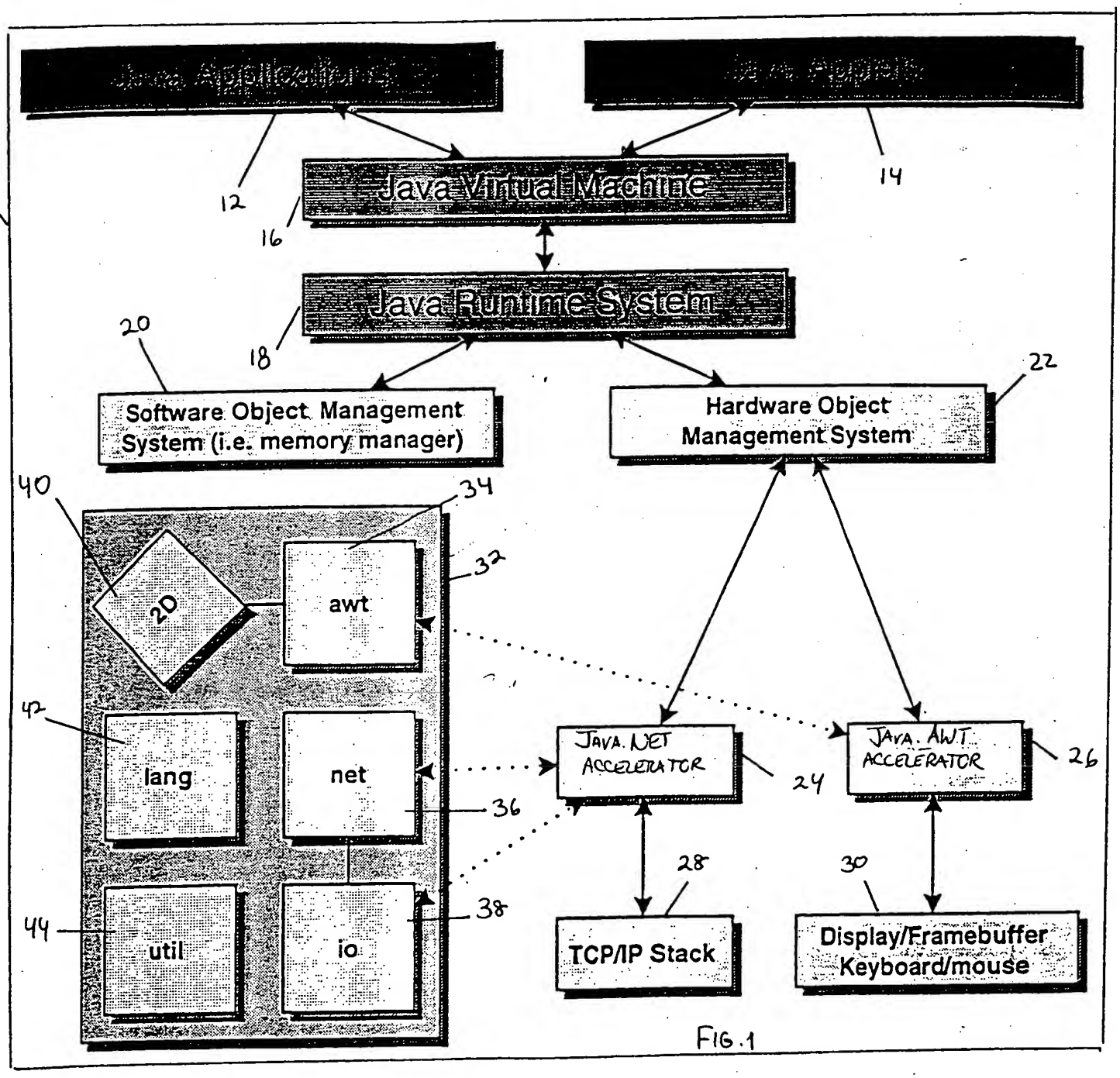


FIG. 1

BEST AVAILABLE COPY

T00290 "C9T9686"

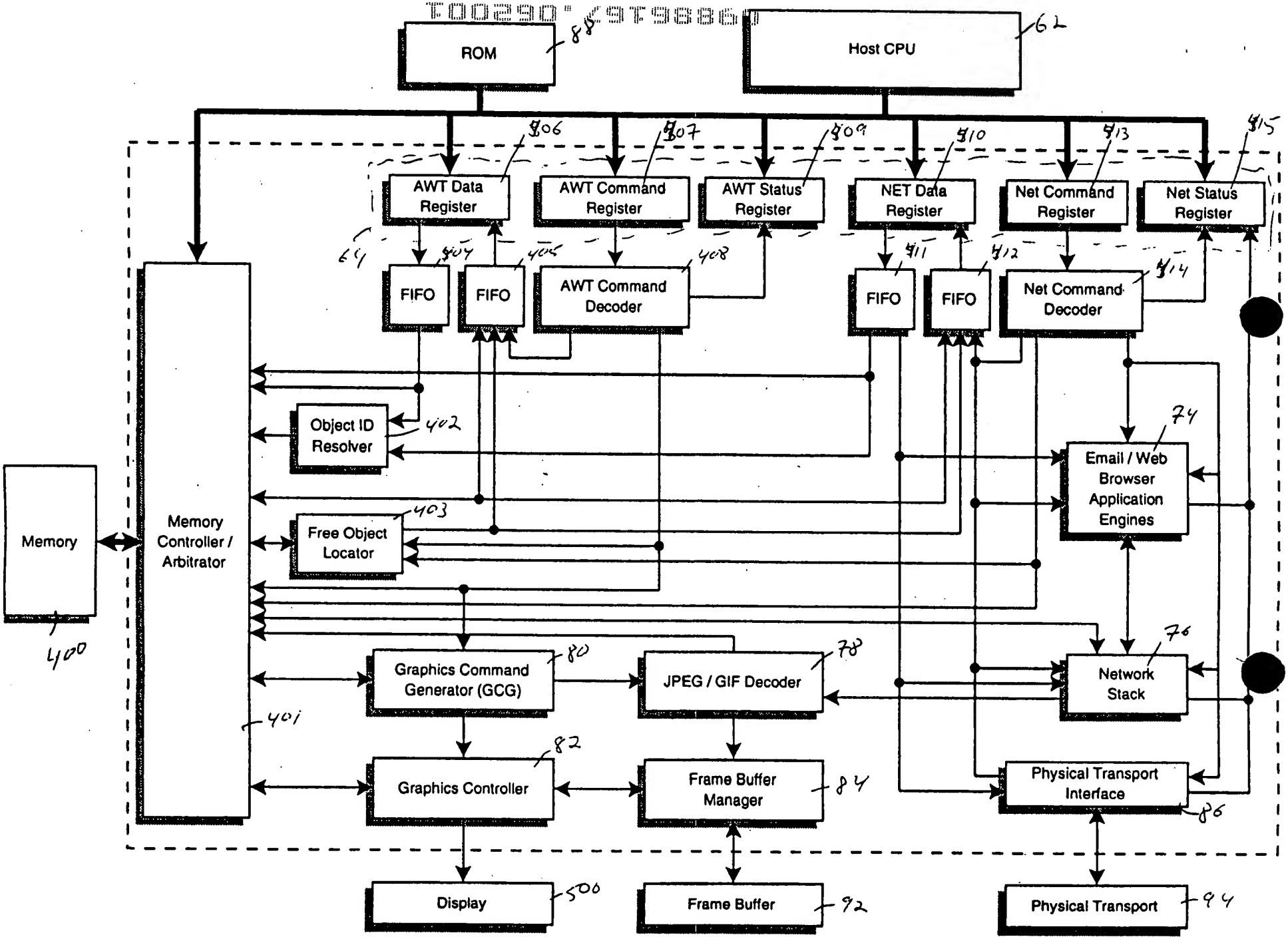


Fig. 2

T00290 "29T98860

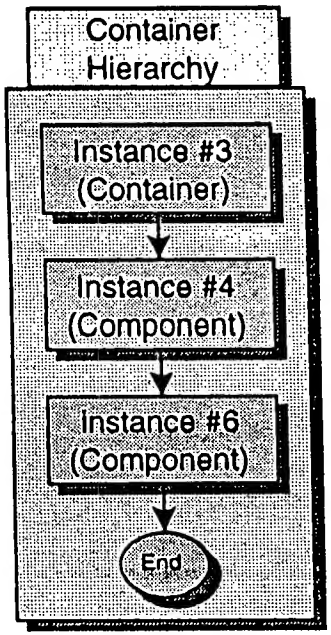


Fig. 4

Object List After Object Instantiations and Deletions

Object #	Memory Block	InUse Flag	Object Type	Obj Link
1	30 byte block	In Use	Frame	
2	30 byte block	In Use	GridLayout	
3	30 byte block	In Use	Container	4
4	30 byte block	In Use	Component	6
5	30 byte block	Free	n/a	
6	30 byte block	In Use	Component	0
n	30 byte block	Free		

Fig 3

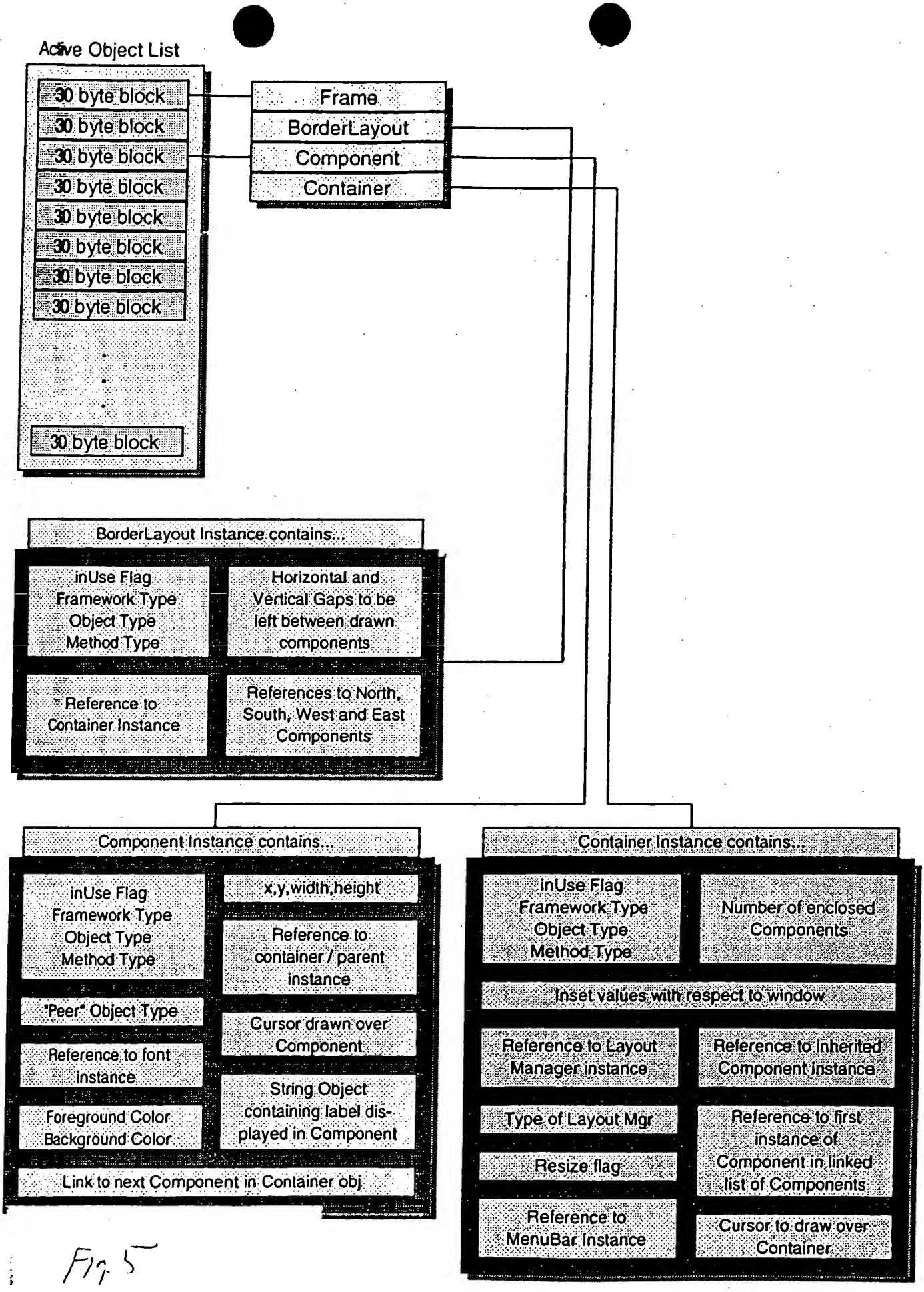


Fig 5

09865267 - 060901

08645769 - 050204

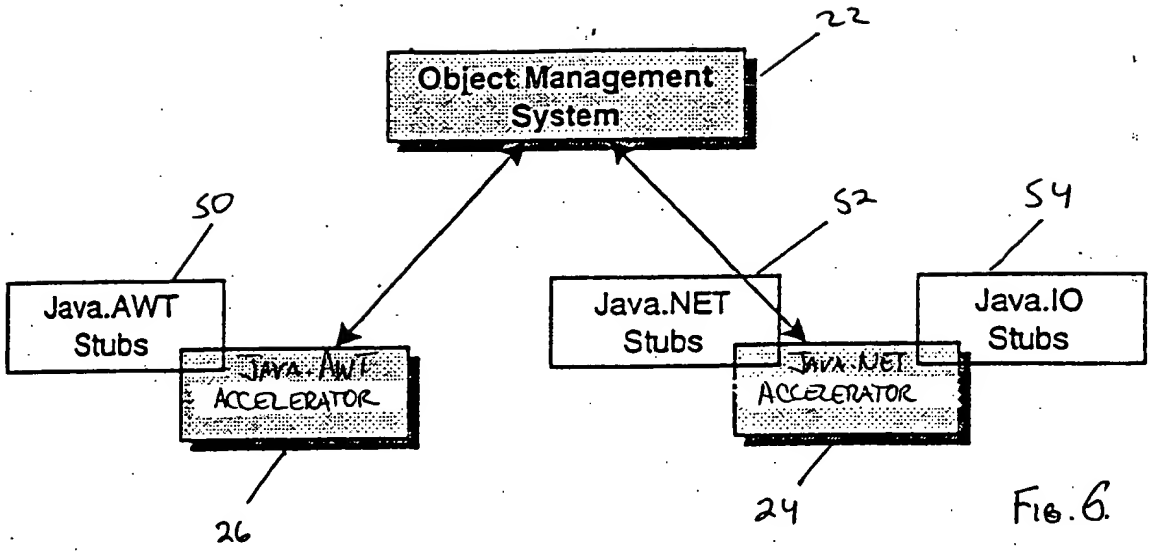


FIG. 6.

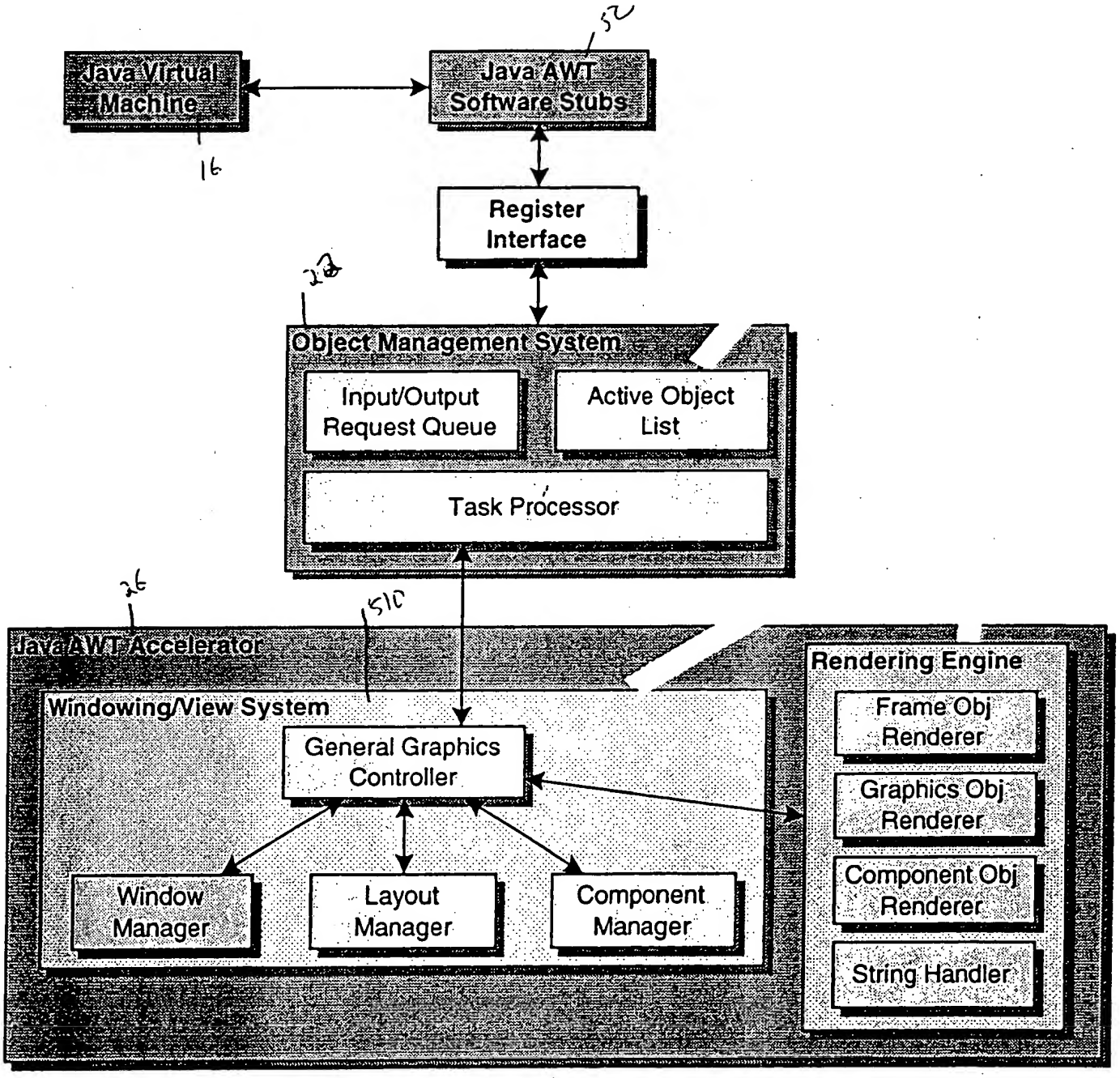


Fig 7

08854697 - 050501

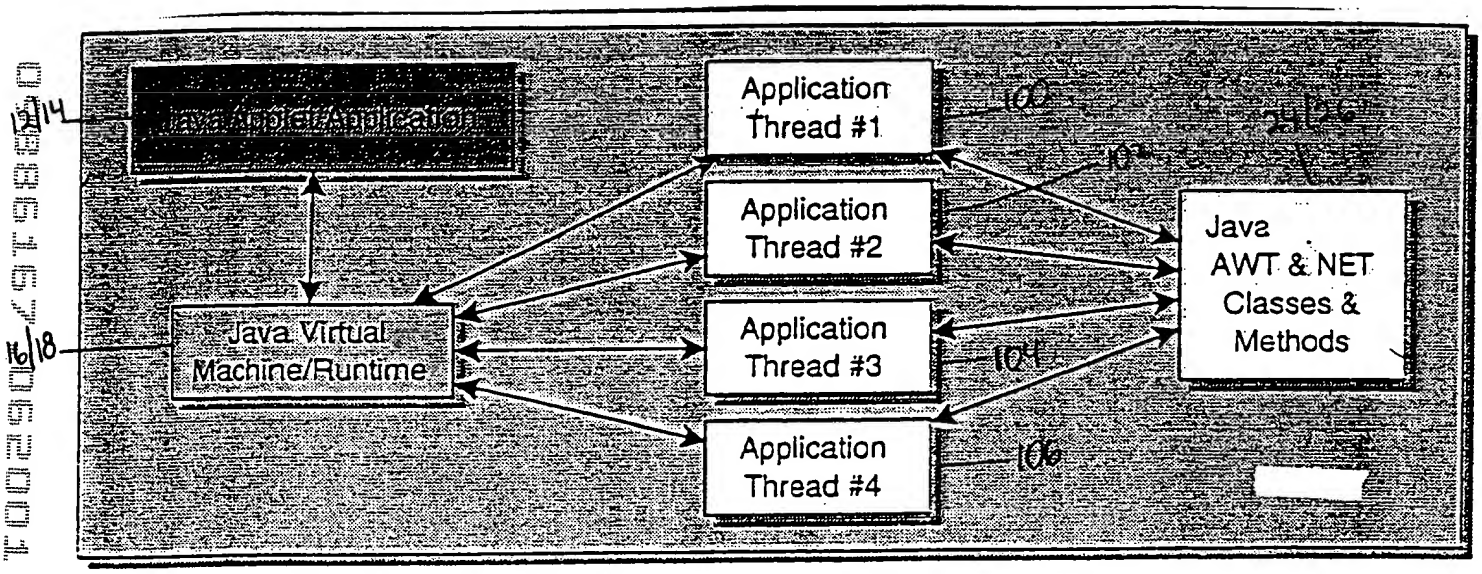

Java Applet/Application
Java Virtual Machine/Runtime
Application Thread #1
Application Thread #2
Application Thread #3
Application Thread #4
Java AWT & NET Classes & Methods
100
102
104
106
12/14
16/18
24/26

Fig 8

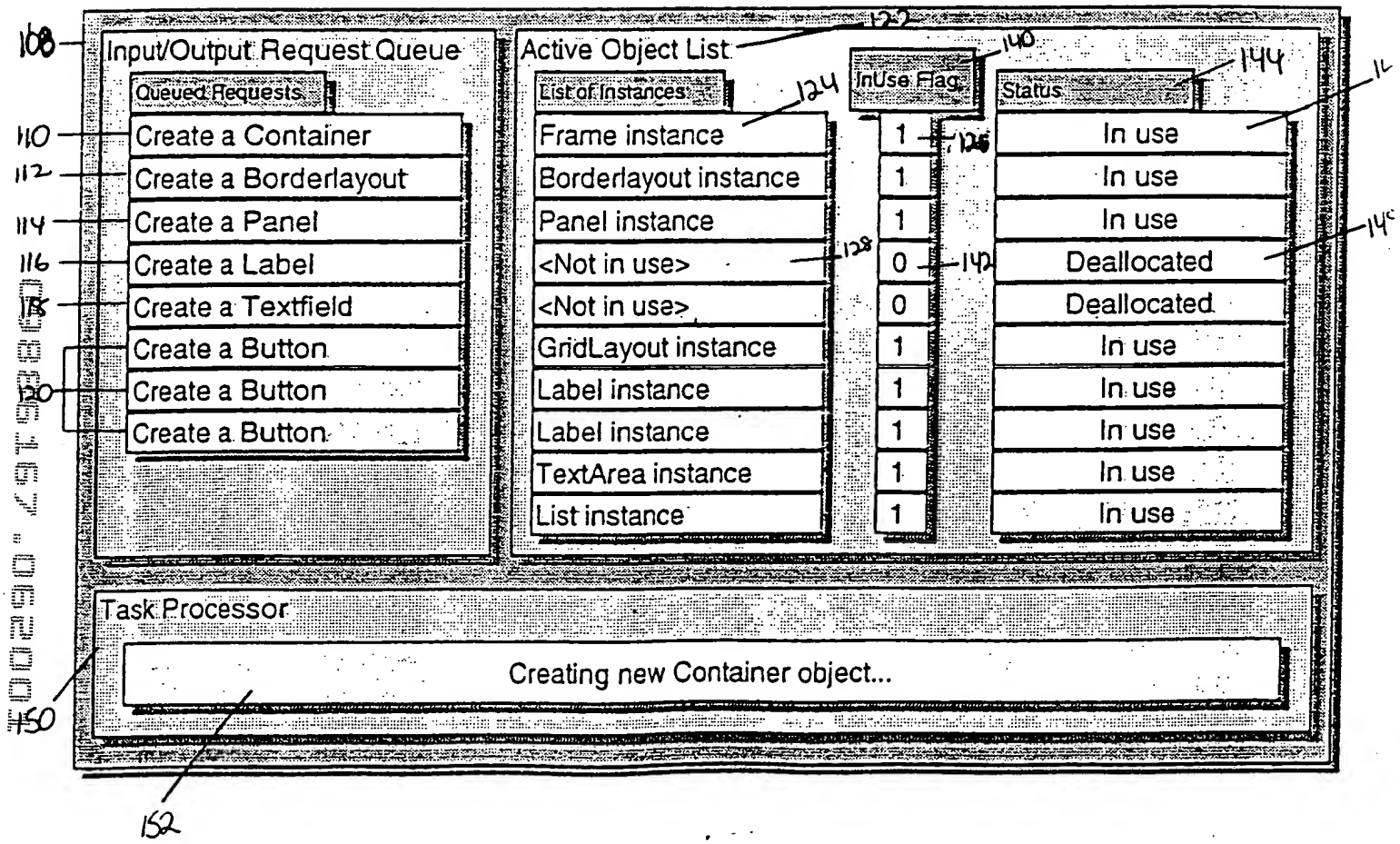

108
Input/Output Request Queue
Queued Requests
110
Create a Container
112
Create a Borderlayout
114
Create a Panel
116
Create a Label
118
Create a Textfield
Create a Button
120
Create a Button
Create a Button
122
Active Object List
List of Instances
124
InUse Flag
140
Status
144
Frame instance
1
126
In use
Borderlayout instance
1
In use
Panel instance
1
In use
<Not in use>
128
0
142
Deallocated
<Not in use>
0
Deallocated
GridLayout instance
1
In use
Label instance
1
In use
Label instance
1
In use
TextArea instance
1
In use
List instance
1
In use
Task Processor
Creating new Container object...
150
152

Fig 9

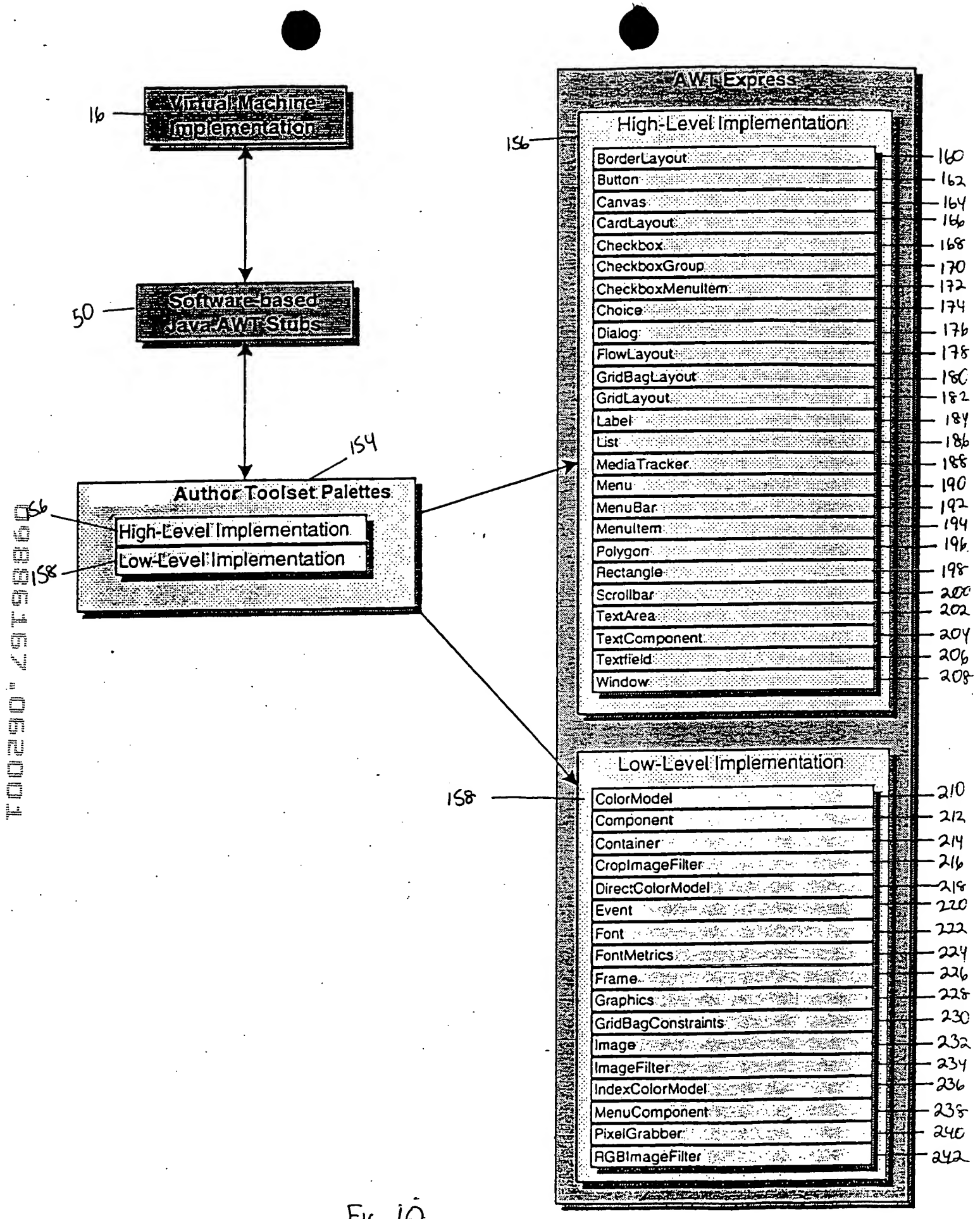

Virtual Machine Implementation
16
Software-based Java AWT Stubs
50
Author Toolset Palettes
154
High-Level Implementation
156
Low-Level Implementation
158
AWT Express
High-Level Implementation
BorderLayout
Button
Canvas
CardLayout
Checkbox
CheckboxGroup
CheckboxMenuItem
Choice
Dialog
FlowLayout
GridBagLayout
GridLayout
Label
List
MediaTracker
Menu
MenuBar
MenuItem
Polygon
Rectangle
Scrollbar
TextArea
TextComponent
Textfield
Window
160
162
164
166
168
170
172
174
176
178
180
182
184
186
188
190
192
194
196
198
200
202
204
206
208
Low-Level Implementation
ColorModel
Component
Container
CropImageFilter
DirectColorModel
Event
Font
FontMetrics
Frame
Graphics
GridBagConstraints
Image
ImageFilter
IndexColorModel
MenuComponent
PixelGrabber
RGBImageFilter
210
212
214
216
218
220
222
224
226
228
230
232
234
236
238
240
242

FIG. 10

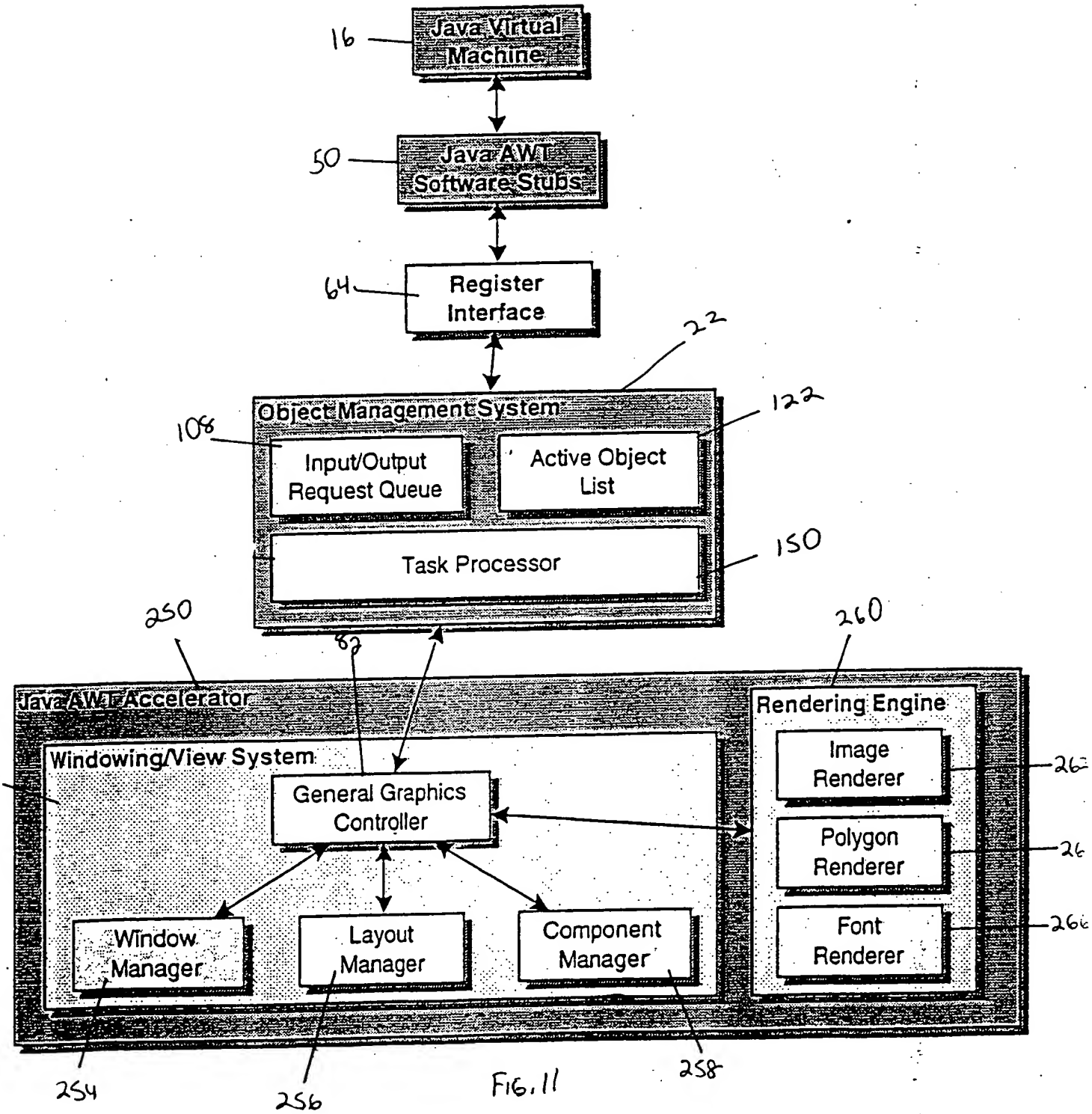

16
Java Virtual Machine
50
Java AWT Software Stubs
64
Register Interface
22
Object Management System
108
Input/Output Request Queue
122
Active Object List
Task Processor
150
250
260
82
Java AWT Accelerator
Rendering Engine
Windowing/View System
252
General Graphics Controller
Image Renderer
Polygon Renderer
Font Renderer
Window Manager
Layout Manager
Component Manager
254
256
258

FIG. 11

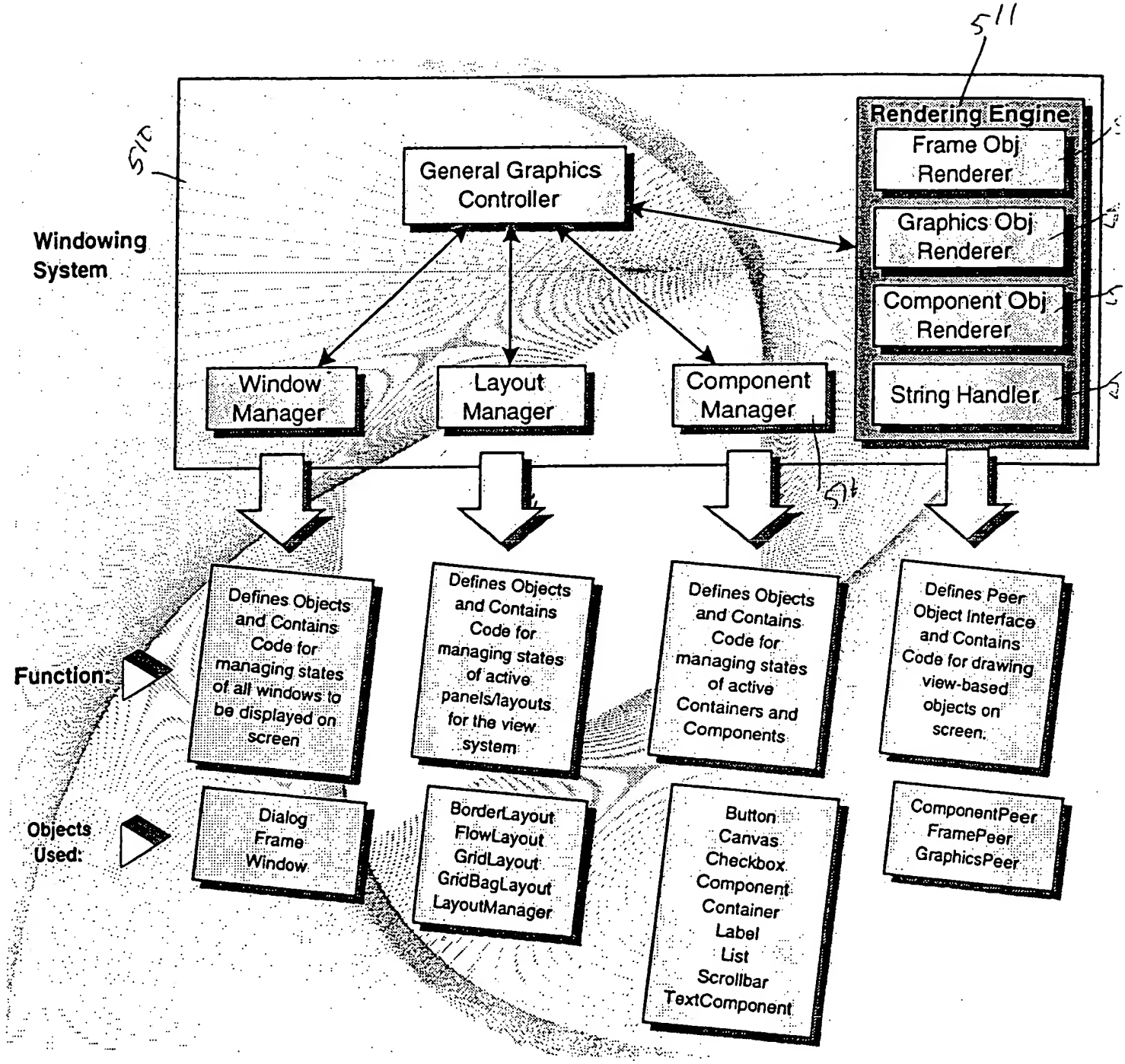

511
Rendering Engine
Frame Obj Renderer
Graphics Obj Renderer
Component Obj Renderer
String Handler
512
Windowing System
General Graphics Controller
Window Manager
Layout Manager
Component Manager
514
Function:
Defines Objects and Contains Code for managing states of all windows to be displayed on screen
Defines Objects and Contains Code for managing states of active panels/layouts for the view system
Defines Objects and Contains Code for managing states of active Containers and Components
Defines Peer Object Interface and Contains Code for drawing view-based objects on screen.
Objects Used:
Dialog
Frame
Window
BorderLayout
FlowLayout
GridLayout
GridBagLayout
LayoutManager
Button
Canvas
Checkbox
Component
Container
Label
List
Scrollbar
TextComponent
ComponentPeer
FramePeer
GraphicsPeer

Fig. 12

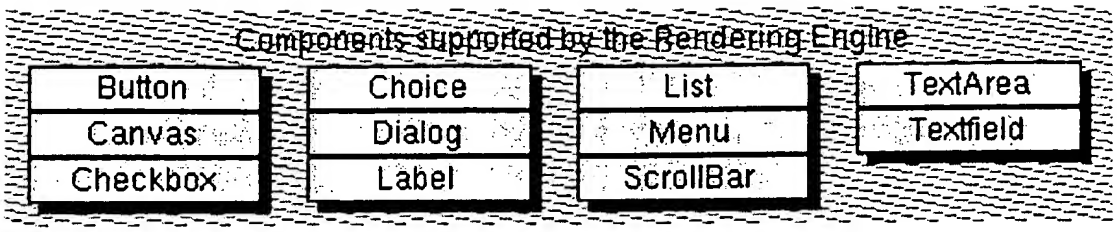
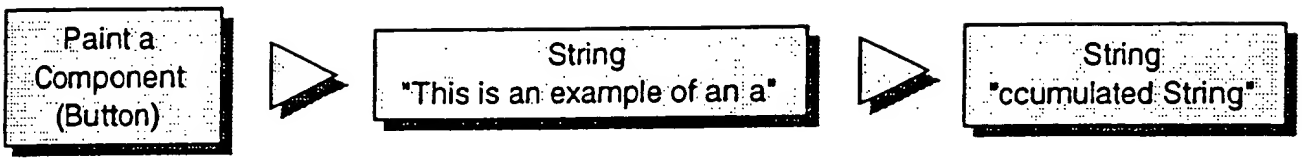


Fig 13

0988459 - 050204

08025705.0960202

The commands:



The result:

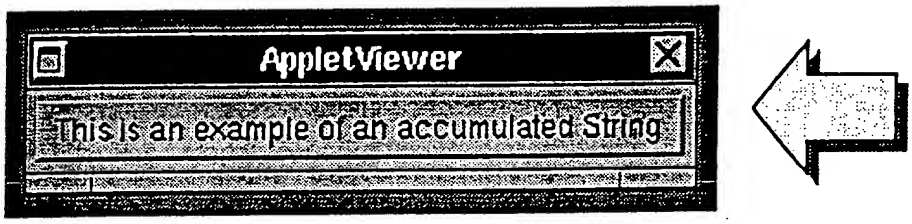


Fig. 14

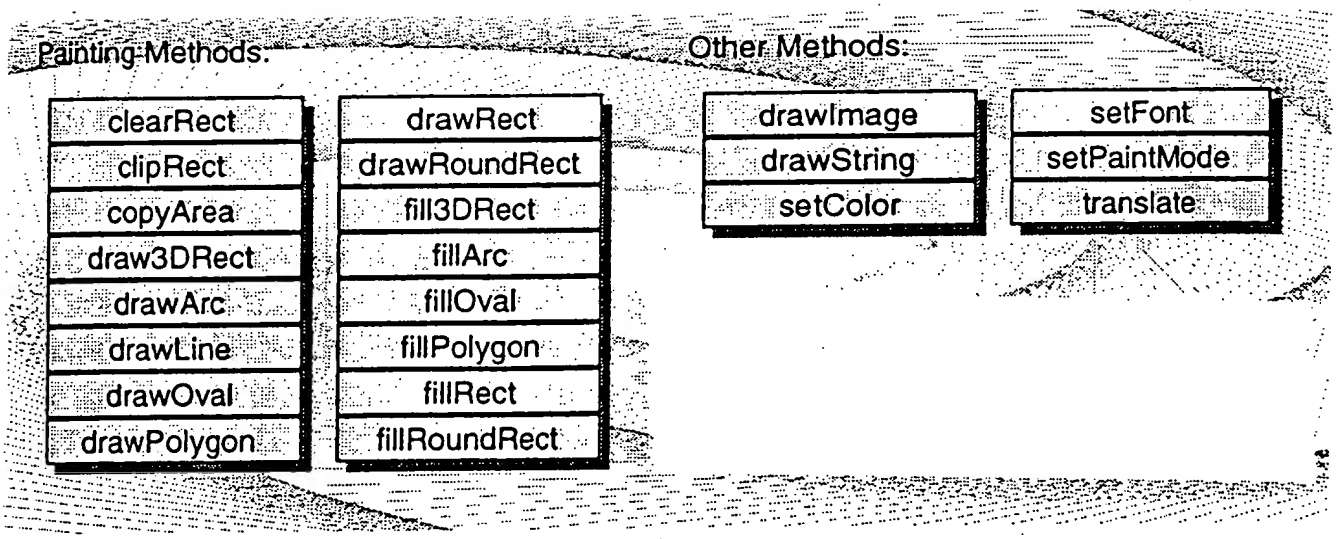


Fig. 15

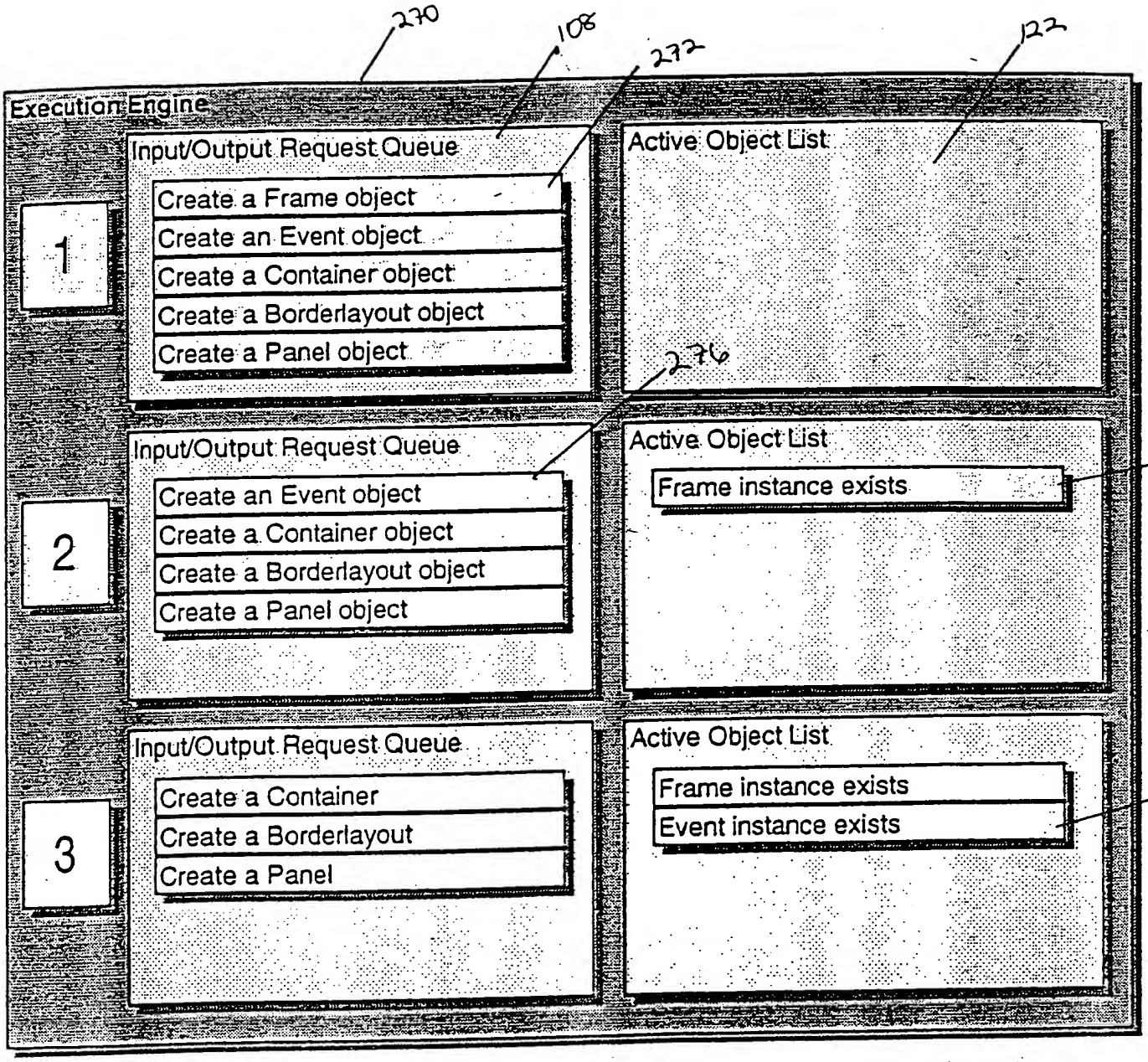

270
108
272
122
Execution Engine
Input/Output Request Queue
Create a Frame object
Create an Event object
Create a Container object
Create a Borderlayout object
Create a Panel object
1
Active Object List
276
Input/Output Request Queue
Create an Event object
Create a Container object
Create a Borderlayout object
Create a Panel object
2
Active Object List
Frame instance exists
274
Input/Output Request Queue
Create a Container
Create a Borderlayout
Create a Panel
3
Active Object List
Frame instance exists
Event instance exists
278

FIG. 16

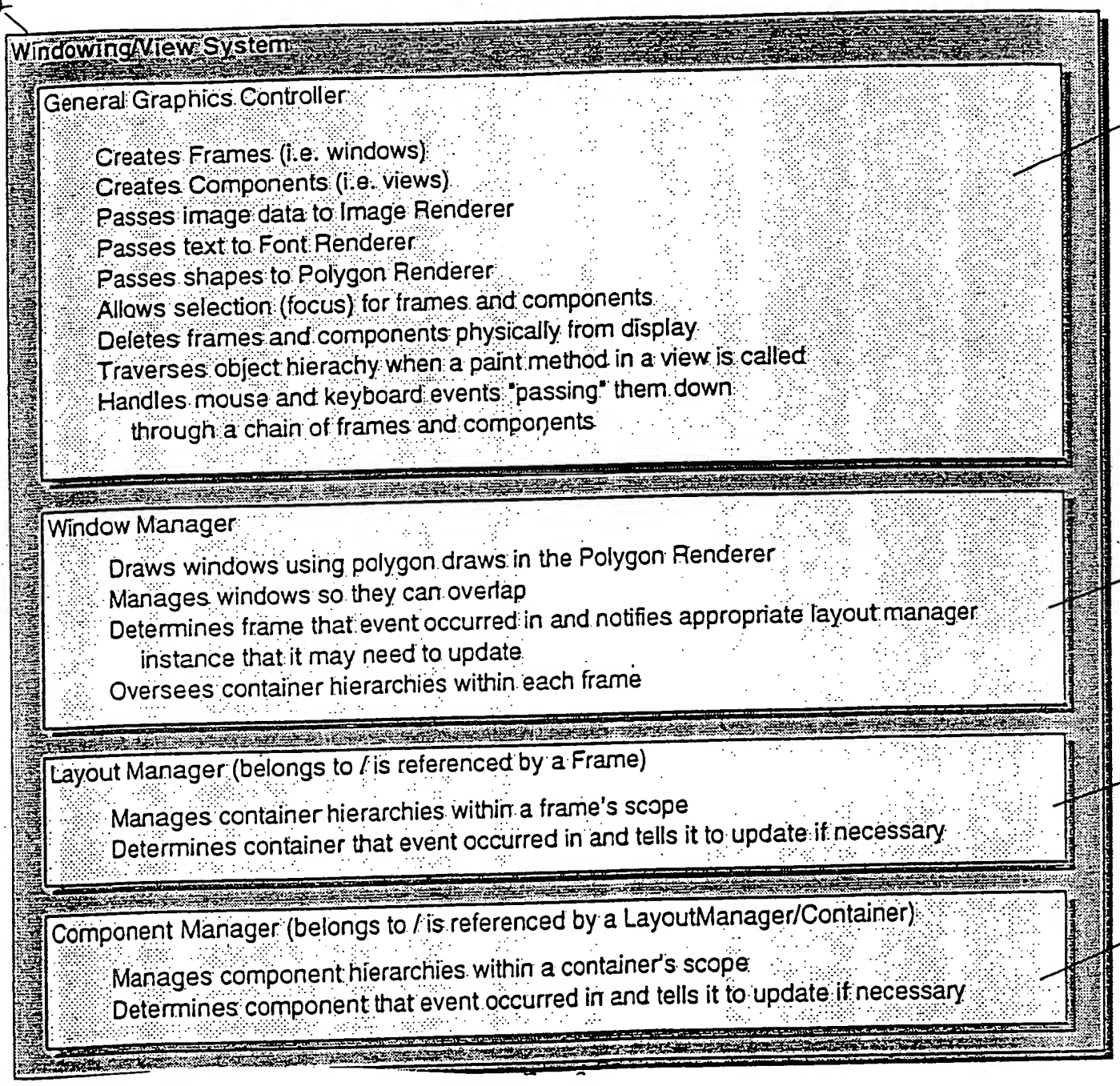

252
Windowing/View System
General Graphics Controller
Creates Frames (i.e. windows)
Creates Components (i.e. views)
Passes image data to Image Renderer
Passes text to Font Renderer
Passes shapes to Polygon Renderer
Allows selection (focus) for frames and components
Deletes frames and components physically from display
Traverses object hierachy when a paint method in a view is called
Handles mouse and keyboard events "passing" them down through a chain of frames and components
Window Manager
Draws windows using polygon draws in the Polygon Renderer
Manages windows so they can overlap
Determines frame that event occurred in and notifies appropriate layout manager instance that it may need to update
Oversees container hierarchies within each frame
Layout Manager (belongs to / is referenced by a Frame)
Manages container hierarchies within a frame's scope
Determines container that event occurred in and tells it to update if necessary
Component Manager (belongs to / is referenced by a LayoutManager/Container)
Manages component hierarchies within a container's scope
Determines component that event occurred in and tells it to update if necessary

FIG. 17

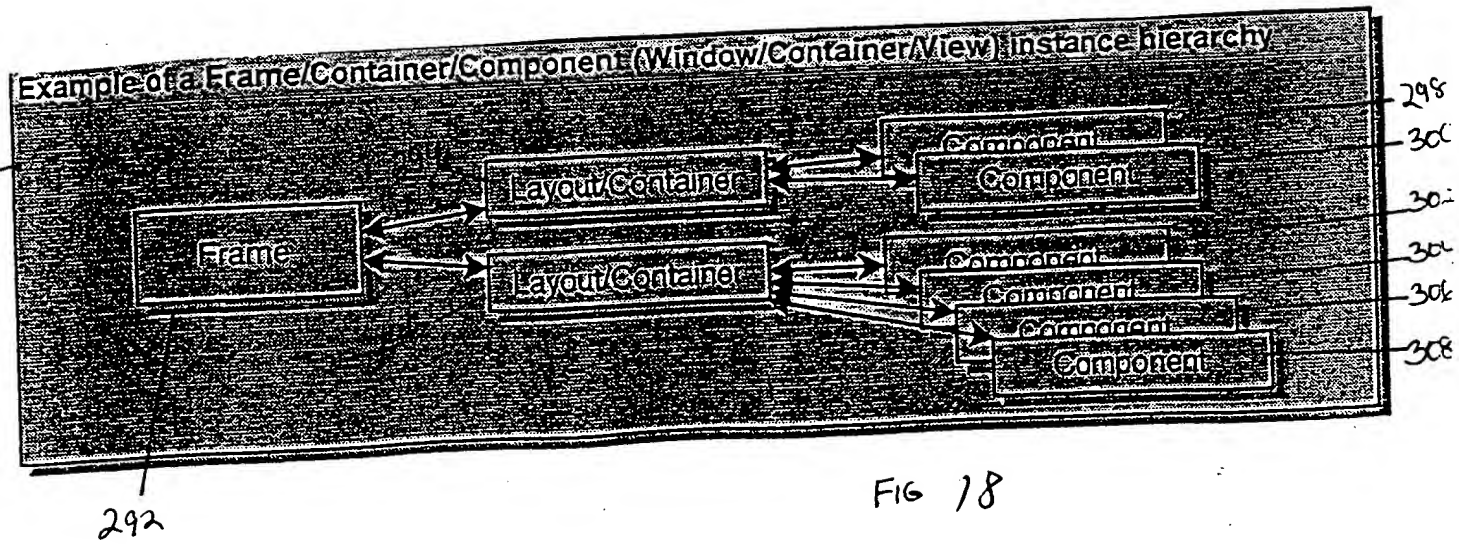

Example of a Frame/Container/Component (Window/Container/View) instance hierarchy
290
Frame
Layout/Container
Layout/Container
Component
Component
Component
298
30
30
30
308
292

FIG 18

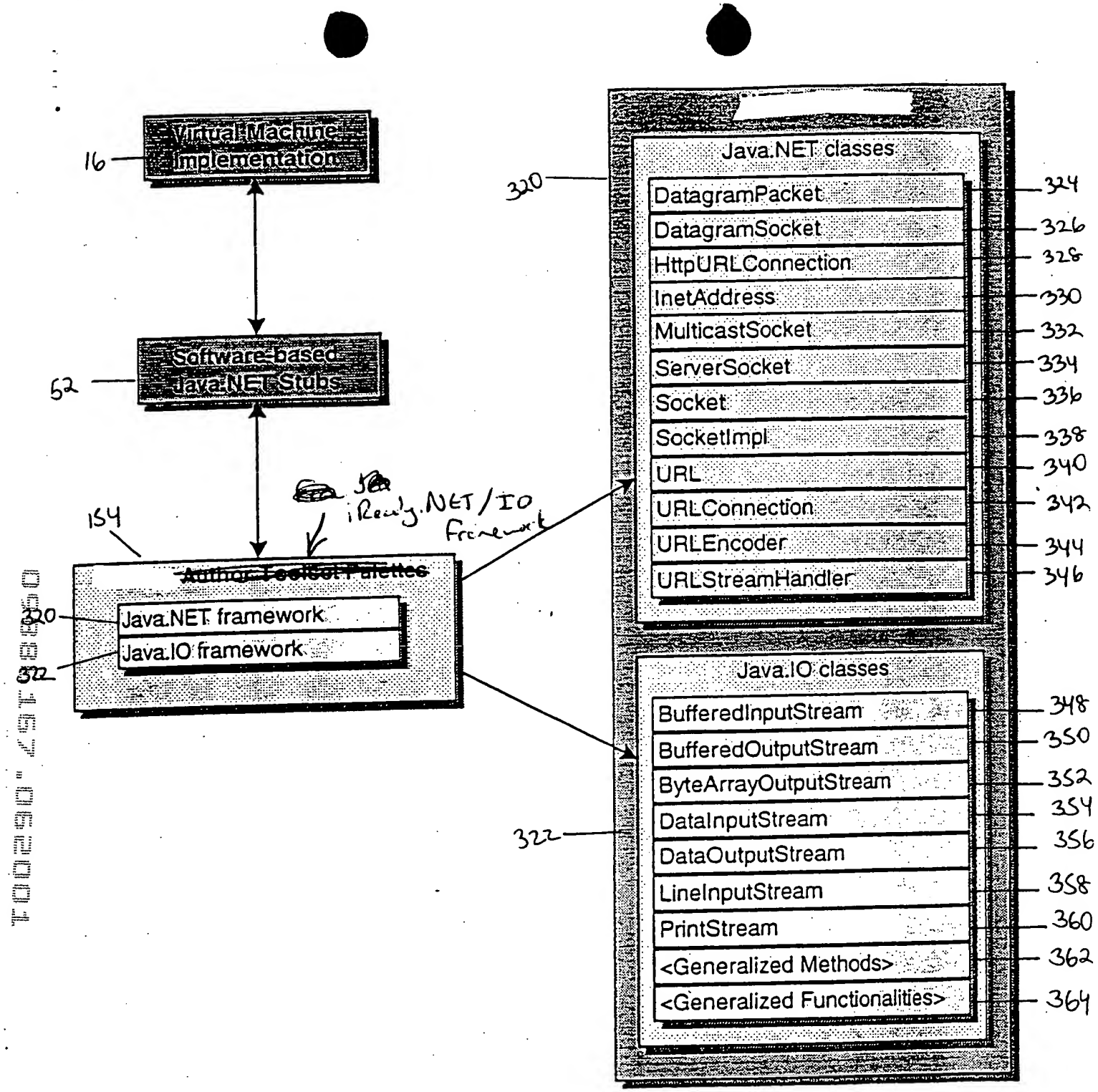

Virtual Machine Implementation
16
Software-based Java.NET Stubs
52
154
iReady.NET/IO Framework
Java.NET framework
320
Java.IO framework
322
Java.NET classes
320
DatagramPacket
DatagramSocket
HttpURLConnection
InetAddress
MulticastSocket
ServerSocket
Socket
SocketImpl
URL
URLConnection
URLEncoder
URLStreamHandler
324
326
328
330
332
334
336
338
340
342
344
346
Java.IO classes
322
BufferedInputStream
BufferedOutputStream
ByteArrayOutputStream
DataInputStream
DataOutputStream
LineInputStream
PrintStream
<Generalized Methods>
<Generalized Functionalities>
348
350
352
354
356
358
360
362
364

Fig 19

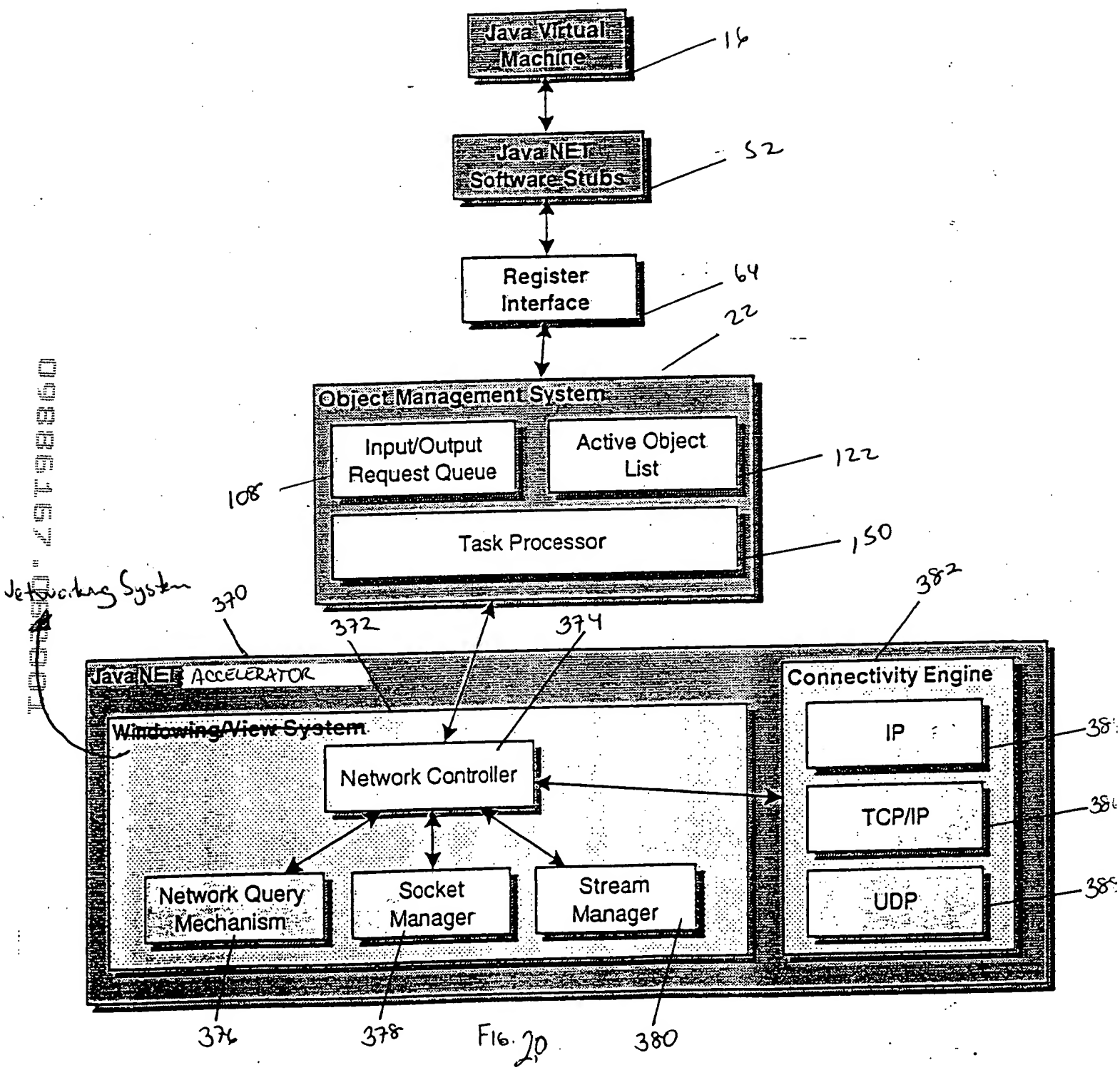

Java Virtual Machine
16
Java.NET Software Stubs
52
Register Interface
64
22
Object Management System
Input/Output Request Queue
Active Object List
122
108
Task Processor
150
Networking System
370
372
374
382
Java.NET ACCELERATOR
Windowing/View System
Network Controller
Connectivity Engine
IP
TCP/IP
UDP
Network Query Mechanism
Socket Manager
Stream Manager
376
378
380

FIG. 20

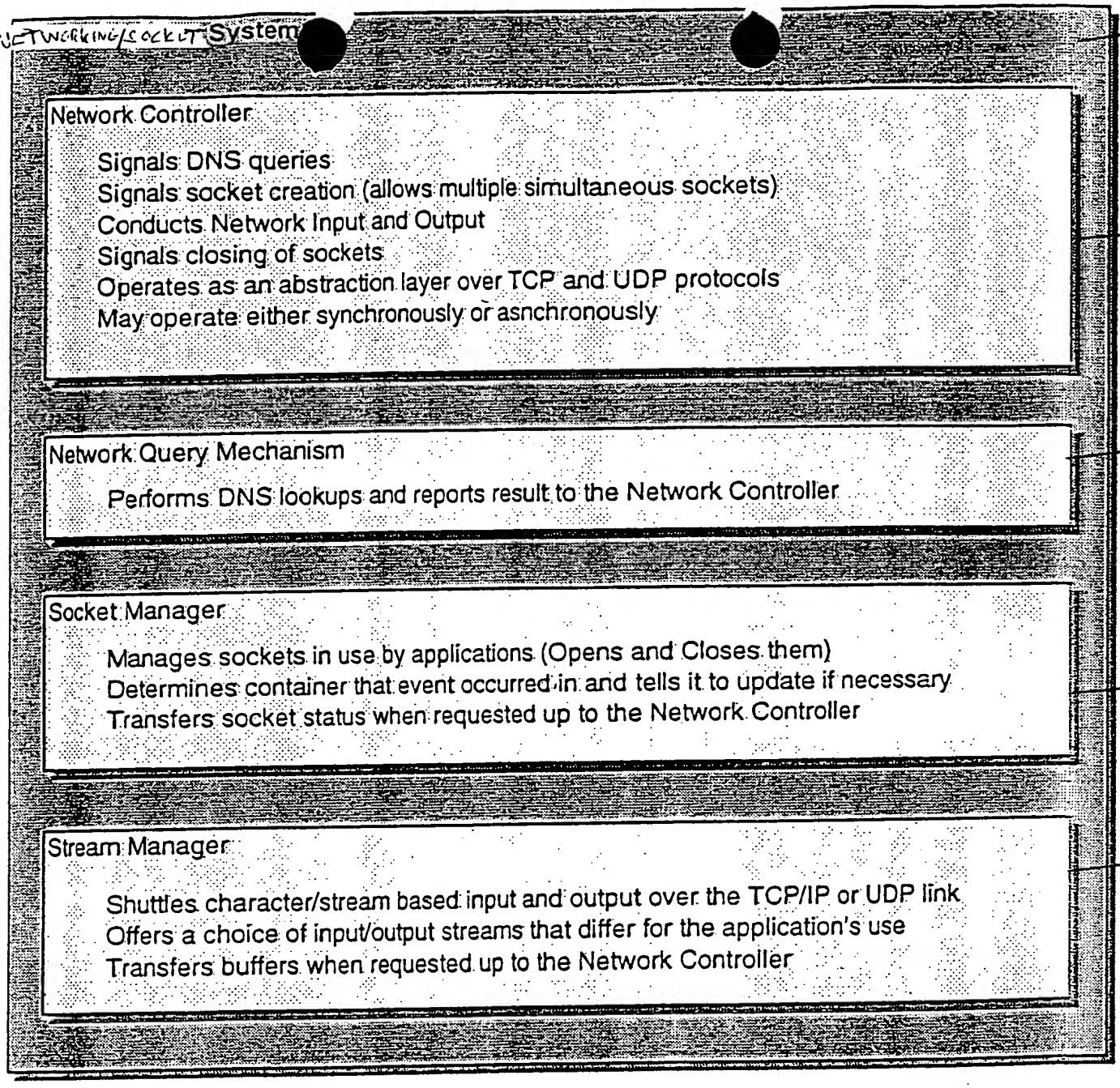


FIG. 2

Doc. 7,596,603